Again he is asked, "Flowers, Complete or Incomplete? Why?" and is allowed a line exactly two inches long in which to give an answer to a question before which the wisest botanist may well quail. When will teachers realize that botanists are not made by the use of such "helps" any more than Latin scholars are made by the use of "ponies"?

—CHARLES E. BESSEY.

**Botanical News.**—The Director of the Missouri Botanical Garden at St. Louis calls attention in a printed circular to the advantages for study afforded by this important institution. Its herbarium includes nearly 250,000 specimens, and its library about 10,000 volumes and 11,000 pamphlets.

A. H. Curtiss, of Jacksonville, Florida, is distributing fine sets of the Marine Algæ of Florida. Each set contains fifty species and is sold for five dollars.

Professor Bruce Fink, of Fayette, Iowa, offers sets of Iowa Lichens, including about 200 species which he sells at the low price of six cents each.

We are glad to see another number of *Pittonia*, the very useful periodical which Professor E. L. Greene issues from time to time. The new part (13) contains papers on the Nomenclature of the Fuller's Teasel, a Proposed New Genus of Cruciferae; New or Noteworthy Species; New Genus of Polemonianae, and New Mexican Eupatoriaceæ—CHARLES E. BESSEY.

## ZOOLOGY.

**Japanese Leeches.**—The discovery of three new land leeches in Japan is of interest to geologists since but one species, *Haemadipsa japonica* Whitman, is all that has been known to occur in that country. The three new species are members of a genus separated from all the genera of land leeches hitherto defined. An account of their external characters and a general outline of their internal organization are presented by Dr. Asajiro Oka in a recent number of the journal published by the Imperial University of Japan. For the new genus the author proposes the name Orobdella. The species of this genus are found in various mountainous parts of Japan, crawling under moss and fallen leaves, or in moist earth, in the same manner as earthworms, which con-

stitute the chief source of their nourishment. Having no jaws, these leeches can neither bite nor suck blood, but swallow the worms entire. *O. octonaria* is one of the largest leeches known. The dimensions of one specimen found by the author is given, length 270 mm., width 14 mm., depth 10 mm.

Dr. Oka adopts the classification of R. Blanchard (1894), and shows the systematic position of Orobdella in the following synoptical table:

Ordo Hirudinea.
- a. Subordo. Rhyncobdellae.
- b. Subordo. Arhyncobdellae.
  - 1. Fam. Gnathobdellidae.
    - Aquatic: gen. Hirudo, Haemopis, etc.
    - Terrestr. gen. Haemadipsa, Xerobdella, Mesobdella.
  - 2. Fam. Herpobdellidae.
    - Aquatic: gen. Herpobdella, Dina, Trocheta.
    - Terrestr: gen. Cylicobdella, Lumbricobdella, Orobdella.

(Journ. Coll. Sci. Imp. Univ. Japan., Vol. VIII, Pt. 2, 1895.).

**The Origin of Tail-forms.**—The use and meaning of the asymmetrical types of tail-fin which are so commonly met with among fishes—e. g., the upturned tail of the shark and sturgeon, and the downwardly extended fin of the flying-fish, are explained by Dr. F. Ahlborn by comparisons founded on experience in rowing. Every tyro knows the consequences which ensue if he holds his blade too obliquely in the water. If the upper edge is inclined too much towards the stern of the boat a brisk pull upon the handle results in the blade jumping out of the water; if, on the other hand, the blade is inclined too much in the opposite direction, it digs into the water and the oarsman "catches a crab." The relevance of these illustrations is found in the fact that the skeletal support of the asymmetrical tails of fishes is generally such that either the upper or lower border of the fin is more resistant to the pressure of the water than the opposite border, a fact which causes the fin in action to assume an oblique instead of a vertical position. The result of such a disposition is that in those cases where the upper part of the tail is stiffer than the lower, the tail in locomotion is driven upwards, as the oar is driven out of the water (heterocercal tail of shark and sturgeon); while in cases where the lower part of the tail is firmer than the upper, the tail tends, in action, to assume a lower position than the rest of the body (flying-fish). The body of the animal, in fact, is made to swing vertically about a horizontal axis running through the center of gravity: in the first group

the tail becomes elevated above the head, in the second group the head becomes raised above the tail. The utility of these types of organization becomes obvious when the habits of the creatures which exhibit them are considered. The first group consists of bottom-haunting fish, which are thus enabled to give free play to their tails while scouring the sea-bottom in search of food ; the second consists entirely of surface-swimming forms which are enabled, by this beautiful adaptation of structure, to swim swiftly beneath the surface of the water without the risk of their tails emerging, and so cause inconvenience and waste of force. The tails of many air breathing aquatic animals, such as the sea-snake and the extinct Ichthyosaurus are constructed upon this latter principle. (Nature, Feb., 1896.)

**The Spermatheca in some American Newts and Salamanders.**—The term *receptaculum seminis* has been used to designate certain structures in the cloacal wall of the female *Necturus maculatus*, which serve as reservoirs in which the zoösperms of the male are received. In order to have a better understanding of the function of these structures, Dr. Kingsbury undertook a study of the cloaca in the female of six species of Urodeles (American). The chosen species represent five families, and two orders of Batrachia, and present a good series from a purely aquatic to as purely a terrestrial existence. The general result has been a recognition of these organs in one form or another in all the species under observation, but there is no unity of structure, hence the term *receptalum seminis* is not strictly applicable, and the mononym *spermatheca* is proposed instead. In some forms many spermathecas would be recognized.

In Diemyctylus, Amblystoma and Necturus the spermathecas assume the form of individual tubules. In Amblystoma the tubules are arranged around depressions. In Spelerpes, Plethodon and Desmognathus consists of a tubular depression of the cloaca into the end of which the clustered tubules open.

As to how the spermatozoa find their way into these resting places, the author suggests that while the theory of Pfeffer of "positive chemotaxis" is highly probable, yet it is also possible that the entrance of the zoösperms may be solely due to their own activity assisted by muscular contractions of the cloaca and spermatheca.

The results of Dr. Kingsbury's observations are thus summarized :—

1. In the genera Necturus, Amblystoma, Diemyctylus, Plethodon and Desmognathus, spermathecas are found in the dorsal wall of the

cloaca of the female, containing zoösperms. Internal fertilization is therefore proven for these forms.

A spermatheca occurs in Spelerpes; in the single specimen examined (taken in the fall) no zoösperms were contained.

In Necturus, Diemyctylus and Amblystoma, there are several tubules or spermathecas opening upon the cloacal epithelium, which serve as reservoirs for the semen.

In Desmognathus, Plethodon and Spelerpes, there is a single mesal spermatheca.

The condition in Spelerpes would seem to indicate that the organ in these latter genera equals the group of tubules found in the first genera plus and exaggerated and modified depression of the cloacal epithelium, such as occurs in Amblystoma.

2. No gland-like structures in addition to the spermatheca occur in the female of Plethodon and Desmognathus.

3. In all the remaining genera a ventral cloacal gland is present.

4. In Amblystoma, Spelerpes and Necturus, in addition to the spermatheca tubules, other tubules occur on the dorsal side of the cloaca.

5. The secretion of the cloacal glands is employed at the time of ovulation.

6. The three glands of the male recognized in the Triton, the cloacal, abdominal and pelvic, occur and are well developed in the five genera examined. This suggests that by all of these spermatophores are deposited.

7. A résumé of the literature and foregoing facts points to a uniform mode of mating and fertilization in all urodeles.

8. Dorsal and ventral ciliated tracts occur in the male of all the genera examined. Cilia in the cloaca of the female were detected only in Amblystoma and *Plethodon glutinosus*, where the tract was not as extensive as in the male. (Proceeds. Amer. Microscop. Soc., Vol. XVII, 1895.)

**Zoological News.**—A second species has been added to the genus Opisthoteuthis founded by Verrill to receive a West Indian species named *O. agassizi*. The new acquisition was obtained by a Misaki fisherman with a hook at a depth of about 25 fathoms in Iagami Bay, Japan. It is described and figured by Dr. Ijima and S. Ikeda under the name *O. depressa*. (Journ. Coll. Sci. Imp. Univ. of Japan, Vol. VIII, Pt. 2, Tokyo, 1895.) This genus is characterized by the fact that the alimentary canal passes directly through the body, instead of

returning to issue near the mouth. Ferrill regards it as the most primitive form of the Cephalopoda.

A new genus of Cottoid fishes from Puget Sound is described by Mr. E. C. Starks. The type species, *Jordania zonope* is in the Museum of the Leland Stanford, Jr., University. (Proceeds. Phila. Acad. Nat. Sci. [1895] 1896).

Mr. J. A. Allen emphasizes the fact that the change of color in the plumage of birds without moulting is due to the gradual wearing off of the light colored edges of the feathers, combined with the more or less blanching of the color of certain parts. Exposure to the elements and friction also produce more or less marked change in color. The author prefaces his remarks with a brief history of origin and persistence of the theory unwarranted by the facts that the feathers of birds change color with the season independent of the process of moulting. (Bull. Amer. Mus. Nat. Hist., Vol. VIII, 1896.)

## ENTOMOLOGY.[1]

**The Asymmetry of the Mouth-parts of Thysanoptera.**—In the Bulletin of the Essex Institute, for 1890, Vol. XXII, the writer published a brief account of some peculiarities he had observed in the mouth-parts of members of this order of insects, and ventured in explanation, the hypothesis that in these insects the mandible of the right side of the head is wanting, and that the parts commonly regarded as mandibles are lobes of the maxillæ. Subsequently the writer called this anomalous condition of the mouth-parts to the attention of members of the Entomological Club of the American Association for the Advancement of Science (Indianapolis meeting, August, 1890) and presented slides showing the peculiarities described. (See Canadian Entomologist, 1890, Vol. XXII, p. 215.)

Nothing, so far as I know, has appeared in American literature since that time with reference to the matter, and the old view concerning the structure of the mouth seems to be still current. In Prof. J. H. Comstock's excellent manual, recently issued (1895) the labrum is represented as perfectly symmetrical, the parts considered by him to be mandibles are incompletely represented, and no mention is made of

[1] Edited by Clarence M. Weed, New Hampshire College, Durham, N. H.